Condensed Matter Seminar

Modeling dynamical processes in socio-technical systems

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Thursday, October 10 ◆ 4:00 P.M.
Room 184 Nieuwland Science Hall

The spreading of infectious diseases, malwares, scientific ideas, memes are just few example of real world phenomena that can be modeled as dynamical processes on networks. In some cases, like for the spreading of a pandemic, the timescale governing disease's diffusion can be decoupled from the timescale driving human contacts. In others, like for the spreading of memes on social networks, the two timescales cannot be separated as the concurrence, duration and order of contacts are crucial ingredients for the diffusion.

During my talk I will first tackle the first limit presenting a realistic predictive data-driven model that considering the time-scale separation between human interactions and force of infection simulates the global spreading of influenza like illness. I will then tackle the second limit presenting a novel mathematical framework for the modeling of highly time-varying networks and processes. In particular I will focus on epidemic spreading, random walks, and controlling strategies in temporal networks.

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